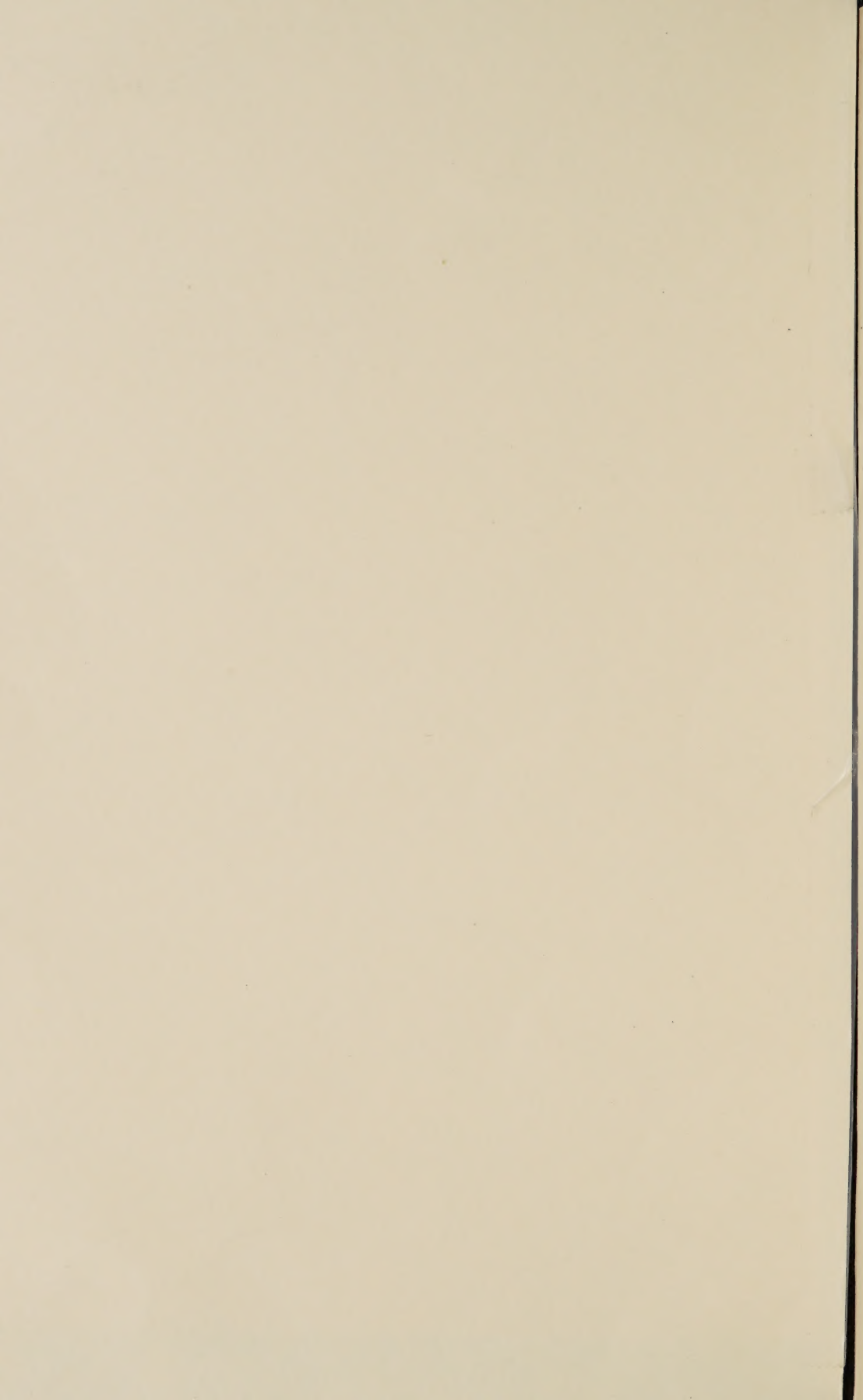


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United States Department of Agriculture

BUREAU OF PLANT INDUSTRY,
Seed and Plant Introduction and Distribution,
WASHINGTON, D. C.

COOPERATIVE EXPERIMENTS WITH FORAGE CROPS, AUTUMN OF 1906—SPRING OF 1907.

The following list comprises the principal forage crops with which the Department of Agriculture will conduct cooperative experiments with farmers during the ensuing year. All applications for autumn cooperations should be made prior to August 15, 1906, and all for spring cooperations prior to April 1, 1907. In case requests for cooperation are received after these dates, there is likely to be insufficient time to arrange the necessary preliminaries.

In addition to the crops mentioned in this circular, the Department is testing with its special cooperators many new things. The list of these cooperators includes those who have shown special aptitude or who have unusual facilities for conducting experimental work, and to these additional privileges are accorded.

As far as possible cooperative experiments are inspected during the season by representatives of this office.

A. J. PIETERS,
Botanist in Charge.

Approved:

B. T. GALLOWAY,
Chief of Bureau.

WASHINGTON, D. C., *April 20, 1906.*

ALFALFA.

This is one of the most important forage crops outside of the clover districts and in many places is replacing clover owing to its greater yield and high feeding value for both dairy and feed stock. Our principal aims with alfalfa are to encourage its culture where it is not now a standard crop and to introduce new varieties. The following are some of the important problems:

(1) In the East and South and in all other sections where ordinary alfalfa can be made to produce satisfactory crops—

Cultural methods, including preparation of the soil.

Fertilizer and inoculation requirements.

Need of nurse crops.

Time and rate of seeding.

Testing of disease-resistant strains.

(2) In the West, comparative tests of varieties, especially as to yield and drought resistance.

(3) In the North, comparative tests of varieties for resistance to cold and disease.

(4) Introduction of new varieties to determine their value in sections for which they seem specially adapted, such as Arabian alfalfa for the Southwest, Turkestan alfalfa for the semiarid regions and northern Montana, and Grimm alfalfa for the extreme North.

GRASSES.

Comparatively few kinds of grasses are generally grown by farmers. In introducing new and little-known kinds the purpose is to find which are best adapted to the various sections of the country when grown alone or in mixtures.

Meadow and pasture mixtures.—Experiments to determine the relative merits of different mixtures of standard grasses.

Grasses for dry-land farming.—Comparative tests of drought-resistant grasses in the semiarid region.

Grasses for high altitudes in the mountain region.—Comparative tests as to adaptability.

New grasses.—Western bluejoint (*Agropyron occidentale*), a native hay and pasture grass that gives promise of becoming important under cultivation on dry lands in the West. It is also valuable as a hay grass on irrigated or subirrigated tracts in the Rocky Mountain region, even at considerable altitudes.

Smooth lyme-grass (*Elymus submuticus*), a native grass that is proving to be of pronounced value in the Rocky Mountain region and the adjacent plains.

GREEN MANURE AND COVER CROPS.

Comparative tests to determine the best plants to grow for green manure and winter cover in the different sections of the country. Among the legumes being tested in this work are several species of vetch; fenugreek; sweet clover and other species of *Melilotus*; horse beans; several species of bur clover, and various new legumes, besides the ordinary cultivated ones. Cooperative experiments are being undertaken to determine the best winter cover crops to prevent soil washing, to plow under for green manure, to hold snow, to produce forage, and combinations of the above objects.

SOY BEANS.

The aims are to secure a wider agricultural use of this crop and, in places where it has not proved satisfactory, to test the influence of inoculation.

Tests of varieties.

Inoculation experiments.

FORAGE SORGHUMS (INCLUDING MILO AND KAFIR CORN).

Comparative tests of varieties, especially for quality and drought resistance. More than 300 varieties are at present being tested by the Department.

CANADA FIELD PEAS, OR ENGLISH PEAS.

Tests of varieties. As a summer crop this is adapted to only the northern portion of the country and the mountain States. As a winter crop it is valuable in the South. It deserves much wider use in agriculture.

COWPEAS.

Tests of varieties, especially as to earliness and drought resistance. A special endeavor is being made to extend the culture of this crop northward.

MILLETS.

Tests of varieties.

NEW OR LITTLE-KNOWN FORAGE CROPS.

There are a considerable number of forage crops grown in other countries which promise to be of value, at least in restricted areas in the United States. The testing of these will be continued until it is determined definitely where they can be grown to advantage. Among these crops are the following:

Thousand-headed kale.—A valuable plant for green feeding in winter, especially for milch cows. At present grown principally in the Pacific Northwest, but apparently worthy of introduction into many other parts of the country, especially the South.

Sainfoin.—This crop is much grown in Europe, especially on rather poor, chalky soils. Its culture in this country is limited, but there is

little doubt that it will thrive in many localities not adapted to alfalfa or clover. It is probable that lack of inoculation caused a large percentage of the failures in the past. The crop should be tried especially on rather poor lands where there is a fair amount of rainfall and where red clover and alfalfa do not thrive.

Sulla.—A clover-like legume much grown and highly prized in Italy and other Mediterranean regions. It should find a place in American agriculture along the Gulf coast south of the region where clover and alfalfa will thrive. It is rather a difficult crop to establish, and the seed is expensive, so that our experiments must be limited for the present to those especially adapted to give it a fair trial. It is believed that the lack of inoculation has had much to do with previous failures.

Canary grass.—Much seed of this grass is imported each year from the Mediterranean region and Argentina for bird food. The crop succeeds well in middle California and will doubtless be found adapted to most parts of the country where small grains do well. The hay is especially liked by animals, and the crop gives promise of replacing for this purpose barley and other grains.

Mung beans (Phaseolus mungo and related species).—These plants are similar in a general way to cowpeas, and, as in that crop, there are many varieties differing as to habit, earliness, and seed characters. In oriental countries they are grown mainly as human food, as the seeds are of a delicate flavor. The plants, however, prove to be valuable as hay and should be tested in comparison with cowpeas. They are decidedly drought resistant and give promise of being very valuable in the West and Southwest.

The Newman bean is a tall, very late variety. The Grecian bean is equally late and was selected especially for its bright-green seeds.

Vetches.—Of the numerous species of vetch, only two are at present utilized to any great extent in American agriculture, namely, the common vetch and the hairy vetch. A number of the other species are distinctly more valuable, at least for special purposes, and these are being introduced where their value has been demonstrated. Vetches should be much more used than at present as winter forage crops, more especially in the southern two-thirds of the country and on the Pacific coast. It is inadvisable to use them in rotation with a small grain crop.

United States Department of Agriculture,

BUREAU OF PLANT INDUSTRY,

Forage Crop Investigations,

WASHINGTON, D. C.

COOPERATIVE EXPERIMENTS WITH FORAGE CROPS, AUTUMN OF 1907—SPRING OF 1908.

The following list comprises the principal forage crops with which the Department of Agriculture will conduct cooperative experiments with farmers during the ensuing year.

All applications for autumn cooperations should be made prior to August 15, 1907 (July 15, 1907, if for alfalfa or crimson clover), and all for spring cooperations prior to April 15, 1908. In case requests for cooperation are received after these dates, there is likely to be insufficient time to arrange the necessary preliminaries.

In addition to the crops mentioned in this circular, the Department is testing with its special cooperators many new things. The list of these cooperators includes those who have shown special aptitude or who have unusual facilities for conducting experimental work, and to these additional privileges are accorded.

As far as possible cooperative experiments are inspected during the season by representatives of this office.

C. V. PIPER,
Agrostologist.

Approved:

B. T. GALLOWAY,
Chief of Bureau.

WASHINGTON, D. C., April 3, 1907.

ALFALFA.

This is one of the most important forage crops outside of the clover districts and in many localities is replacing clover, owing to its greater yield and high feeding value for both dairy and other stock. Our principal aims with alfalfa are to encourage its culture where it is not now a standard crop and to introduce new varieties. The following are some of the important problems that are receiving attention:

(1) In the East and South and in all other sections where ordinary alfalfa can be made to produce satisfactory crops—

Cultural methods, including preparation of the soil.

Fertilizer and inoculation requirements.

Need of nurse crops.

Time and rate of seeding.

Testing of disease-resistant strains.

(2) In the West, comparative tests of varieties, especially as to yield and drought resistance.

(3) In the North, comparative tests of the best hardy strains.

(4) Introduction of new varieties to determine their value in sections for which they seem specially adapted, such as Arabian alfalfa for the Southwest, Turkestan alfalfa for the semiarid regions and northern Montana, and Grimm alfalfa for the extreme North.

RED CLOVER.

Besides the testing and introduction of special strains of clovers, the testing of different varieties as to their adaptability to so-called "clover-sick" lands is under way.

In connection with these variety tests the relative merits of spring and fall seeding are compared. In many instances it has been demonstrated that fall seeding results in a good stand where spring sowing has failed.

CRIMSON CLOVER.

Comparative tests of ordinary with early and late varieties to determine the relative merits of each.

GRASSES.

Comparatively few kinds of grasses are grown by farmers. In introducing new and little-known kinds the purpose is to make careful tests to determine which are best adapted to the various sections of the country, either when grown alone or in mixtures.

Meadow and pasture mixtures.—Comparative tests to determine the relative merits of simple and complex mixtures of standard grasses and clovers in all portions of the country.

Grasses for the South.—In the Gulf Coast region and other portions of the South and in California where the temperature does not fall below 20° F. there are being tested certain grasses which thus far have been grown to a very limited extent in this country. These are Para grass and Guinea grass. They are rather coarse-growing grasses and give heavy yields of a very good quality of hay. They are propagated almost entirely by root cuttings, as the seed is usually very poor.

Native grasses under cultivation.—Tests conducted with *Agropyron occidentale*, commonly called bluejoint or western wheat-grass, have indicated that this grass is worthy of attention under cultivation. It will likely prove of value both on subirrigated and on dry land in the West, and it is desired to test it thoroughly to determine its cultural requirements.

SWEET SORGHUMS.

Comparative tests of the best varieties—some new—both for forage and sirup production.

DWARF MILO.

An extra dwarf selected strain, adapted especially to southern Kansas, Oklahoma, Texas, and New Mexico.

KAFIR CORN.

Selected strains of seed both of the Black-Hulled White and of the Red varieties.

GREEN-MANURE AND COVER CROPS.

Comparative tests of the most promising crops to grow for green manure and winter cover in the different sections of the country. Among the legumes being tested in this work are several species of vetch, fenugreek, sweet clover, horse beans, several species of bur clover, and various new legumes, besides the ordinary cultivated ones. Cooperative tests are also undertaken to determine the best winter cover crops to prevent soil washing, to plow under for green manure, to hold snow, to produce forage, and combinations of the above objects.

SOY BEANS.

The aims are to secure a wider agricultural use of this crop. For grain production recently introduced varieties much outyield the older kinds. In the South the larger late varieties are being used by an increasing number of farmers for hay in preference to cowpeas, especially when cultivated in rows.

COWPEAS.

Tests of varieties, especially as to yields both of hay and grains.

CANADA FIELD PEAS, OR ENGLISH PEAS.

Tests of varieties. As a summer crop this pea is adapted to only the northern portion of the country and the mountain States. As a winter crop it is used in the South. It deserves much wider use in agriculture.

MILLETS.

Tests of varieties.

NEW OR LITTLE-KNOWN FORAGE CROPS.

There is a considerable number of forage crops grown in other countries or locally in this country which deserve wider culture. The testing of these will be continued until it is determined definitely where they can be grown to advantage. Among these crops are the following:

Thousand-headed kale.—A valuable plant for green feeding in

winter, especially for milch cows. At present grown principally in the Pacific Northwest, but worthy of introduction into many other parts of the country, especially the South.

Sainfoin.—This crop is grown in Europe, especially on rather poor, chalky soils. Its culture in this country is limited, but there is little doubt that it will thrive in many localities not adapted to alfalfa or clover. It is probable that lack of inoculation caused a large percentage of the failures in the past. The crop should be tried especially on rather poor lands where there is a fair amount of rainfall and where red clover and alfalfa do not thrive.

Sulla.—A clover-like legume much grown and highly prized in Italy and other Mediterranean regions. It should find a place in American agriculture along the Gulf coast south of the region where clover and alfalfa will thrive. It is a rather difficult crop to establish, and the seed is expensive, so that seed can be sent for the present only to those especially prepared to give it a careful trial. It is believed that the lack of inoculation has had much to do with previous failures.

Canary grass.—Much seed of this grass is imported each year from the Mediterranean region and Argentina for bird food. The crop succeeds well in middle California and will doubtless be found adapted to most parts of the country where small grains do well. The hay is especially liked by animals, and the crop gives promise of replacing for this purpose barley and other grains.

Mung beans (*Phaseolus radiatus*).—These plants are similar in a general way to cowpeas, and, as in that crop, there are many varieties differing as to habit, earliness, and seed characters. In oriental countries they are grown mainly as food for man, as the seeds are of a delicate flavor. The plants, however, prove to be valuable as hay and should be tested in comparison with cowpeas. They are decidedly drought resistant and give promise of being very valuable in the West and Southwest. The Newman bean is a tall, very late variety. The Grecian bean is equally late and was selected especially for its bright-green seeds.

Vetches.—Of the numerous species of vetch only two are at present utilized to any great extent in American agriculture, namely, the common vetch and the hairy vetch. A number of the other species are distinctly more valuable, at least for special purposes, and these are being introduced where their value has been demonstrated. Vetches should be much more used than at present as winter forage crops, more especially in the southern two-thirds of the country and on the Pacific coast. It is inadvisable to use them in rotation with a small-grain crop.